WE CLAIM:

1. An athermal optical element comprising a silver chloride or cesium bromide surface having a surface figure of <200 nm.

2. An athermal optical element comprising a surface of a crystalline, cubic material with a surface figure of <200 nm, said material having an index of refraction, n, and a coefficient of expansion, α, such that:

$$dn/dT = -n\alpha$$

3. An optical element of claim 1 wherein said silver chloride or cesium bromide surface is coated.

4. An optical element of claim 3 wherein said coating is an antireflection, index adjusting, filter, or interference coating.

5. An optical element of claim 1 which is permanently affixed to a substrate by an adhesive which is not UV cured.

6. In an optical demultiplexer useful for dispersing radiation of multiple wavelengths in the range of about 1300-1700 nm comprising an optical window which transmits such radiation and/or an etalon which disperses such radiation, the improvement wherein said window and/or etalon is athermal and comprises silver chloride or cesium bromide.

7. In a laser cavity comprising at least one optical window, the improvement wherein said optical window is an athermal optical element of claim 1.

8. An optical system comprising an optical fiber or an optical waveguide optically coupled to a demultiplexer of claim 6.

9. An athermal optical element of claim 1 wherein said AgCl or CsBr is a single crystal.

10. A demultiplexer of claim 6 wherein said AgCl or CsBr is a single crystal.

11. In an optical demultiplexer useful for dispersing radiation of multiple wavelengths in the range of about 1300-1700 nm comprising an optical window which transmits such radiation and/or an etalon which disperses such radiation, the improvement wherein said window and/or etalon comprises a cubic crystalline material which is optically athermal, said material having an index of refraction, n, and a coefficient of expansion, α, such that:

$$dn/dT = -n\alpha$$

12. An athermal optical element of claim 9 consisting essentially of silver chloride.

13. An optical demultiplexer of claim 6 wherein said window and/or etalon consists essentially of silver chloride.

14. An optical demultiplexer of claim 6 wherein said window and/or etalon has a surface figure of <200 nm.

15. An athermal optical composite material comprising at least two layers of different compositions wherein the total optical pathlength, *nL*, across said layers is essentially independent of temperature.

16. A composite material of claim 15 wherein each of said layers comprises a glass composition, a crystalline material or a polymeric material.

17. A composite material of claim 15 wherein said layers are glass/crystalline, glass/polymeric or polymeric/crystalline composites.

18. A composite material of claim 17 having a surface with a surface figure of <200 nm.

19. In an optical demultiplexer useful for dispersing radiation of multiple wavelengths in the range of about 1300-1700 nm comprising an optical window which

transmits such radiation and/or an etalon which disperses such radiation, the improvement wherein said window and/or etalon comprises a composite material of claim 15.

20. In a laser cavity comprising at least one optical window, the improvement wherein said optical window comprises a composite material of claim 15.

21. An optical system comprising an optical fiber or an optical waveguide optically coupled to a demultiplexer of claim 19.

22. A demultiplexer of claim 19 wherein said composite material has a surface with a surface figure of <200 nm.

23. A device for telecommunications applications comprising a window and/or an etalon which (a) is athermal, (b) is transmitting radiation of multiple wavelengths in the range of about 1300-1700 nm in which are digitally encoded information data in a demultiplexable format, and (c) is optically coupled to an optical fiber or optical waveguide also transmitting radition in said wavelength range, wherein said window and/or etalon comprises (a) AgCl, CsBr or other cubic, crystalline material having an index of refraction, n, and a coefficient of expansion, α, such that:

$$dn/dT = -n\alpha$$

or (b) a composite material of claim 15.

24. A device of claim 23 comprising a demultiplexer containing said window and/or etalon.

25. An athermal cubic crystalline material in which is being transmitted radiation of multiple wavelengths in the range of about 1300-1700 nm in which are digitally encoded information data in a demultiplexable format.

26. A material/radiation combination of claim 25 wherein said material is AgCl or CsBr.

27. An optical composite material of claim 17 comprising a glass, a polymric material and/or a crystalline material laminated, joined, or bonded to each other.

28. A composite material of claim 15 in which is being transmitted radiation of multiple wavelengths in the range of about 1300-1700 nm in which are digitally encoded information data in a demultiplexable format.

29. A method of athermally transmitting, reflecting, refracting and/or demultiplexing, radiation of multiple wavelengths in the range of 1300-1700 nm in which are digitally encoded information data in a demultiplexible format, comprising impinging said radiation on and/or through an optical component comprising (a) AgCl, CsBr, or other athermal cubic crystalline material, or (b) an athermal, optical composite material comprising at least two layers of different compositions wherein the total optical pathlength, nL, across said layers is essentially independent of temperature.